

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
28 February 2002 (28.02.2002)

PCT

(10) International Publication Number  
WO 02/017030 A3

(51) International Patent Classification<sup>7</sup>: G05B 19/418

(21) International Application Number: PCT/US01/26315

(22) International Filing Date: 22 August 2001 (22.08.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
09/643,614 22 August 2000 (22.08.2000) US

(71) Applicant (for all designated States except US): ON-  
WAFER TECHNOLOGIES, INC. [US/US]; 3478  
Buskirk Avenue, Suite 1010, Pleasant Hill, CA 94523  
(US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): FREED, Mason, L.  
[US/US]; 2708 Jones Road, #2, Walnut Creek, CA 94596  
(US). MUNDT, Randall, S. [US/US]; 4820 Wingate  
Drive, Pleasanton, CA 94566 (US). SPANOS, Costas,  
J. [US/US]; 3292 Springhill Road, Lafayette, CA 94549  
(US).

(74) Agent: WILLIAMS, Larry; 122 Calistoga Road, PMB-  
301, Santa Rosa, CA 95409-3702 (US).

(81) Designated States (national): AE, AG, AL, AM, AT; AU,  
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ,  
DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR,  
HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,  
LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,  
NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ,  
TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM,  
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian  
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European  
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,  
IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF,  
CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD,  
TG).

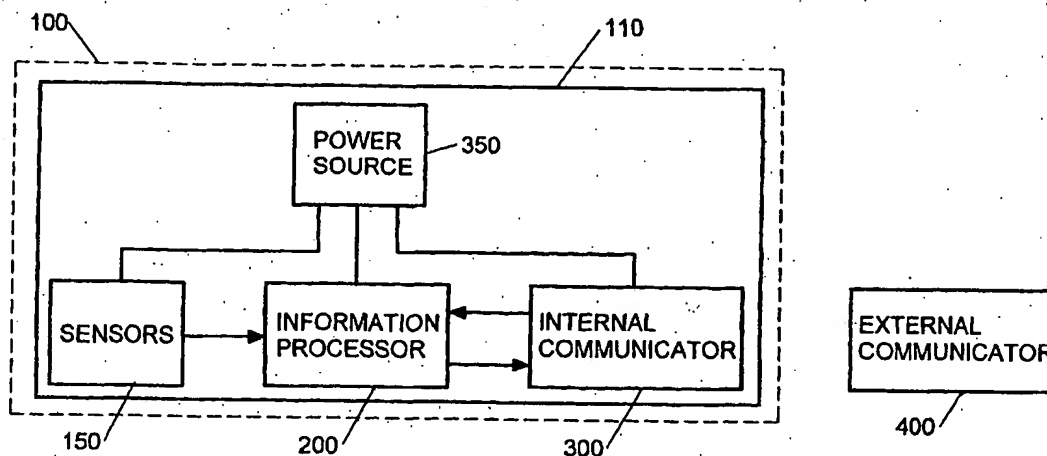
**Published:**

- with international search report
- before the expiration of the time limit for amending the  
claims and to be republished in the event of receipt of  
amendments

(88) Date of publication of the international search report:  
9 January 2003

For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.

(54) Title: METHODS AND APPARATUS FOR OBTAINING DATA FOR PROCESS OPERATION, OPTIMIZATION, MONI-  
TORING, AND CONTROL



(57) Abstract: Data are collected for deriving response models and information required for developing and maintaining processes and process tools. Methods and apparatus for collecting the data include a sensor apparatus (100) capable of collecting data with less perturbation and fewer disruptions than is usually possible using standard methods. The sensor apparatus is capable of being loaded into a process tool. From within the process tool, one embodiment of the sensor apparatus is capable of measuring data, processing data, storing data, and transmitting data. The sensor apparatus has capabilities for near real time data collection and communication.

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 01/26315

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 G05B19/418

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G05B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 389 769 A (YAMASHITA TEPPEI ET AL) 14 February 1995 (1995-02-14)  the whole document	1,2,5, 7-27, 32-35
X	DE 43 27 342 A (AEG SENSORSYSTEME GMBH) 23 February 1995 (1995-02-23)  the whole document	1,2,5, 7-27, 32-35 4,6
Y	US 5 526 293 A (MOZUMDER PURNENDU K ET AL) 11 June 1996 (1996-06-11) abstract	4
Y	EP 0 337 669 A (RENISHAW PLC) 18 October 1989 (1989-10-18) abstract	6

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents:

\*A\* document defining the general state of the art which is not considered to be of particular relevance

\*E\* earlier document but published on or after the international filing date

\*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

\*O\* document referring to an oral disclosure, use, exhibition or other means

\*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*Z\* document member of the same patent family

Date of the actual completion of the international search

31 October 2002

Date of mailing of the international search report

07/11/2002

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel (+31-70) 340-2040, Tx. 31 651 epo nl.  
Fax (+31-70) 340-3016

Authorized officer

Tran-Tien, T

## INTERNATIONAL SEARCH REPORT

ational Application No  
PCT/US 01/26315

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 00 02236 A (MEMC ELECTRONIC MATERIALS) 13 January 2000 (2000-01-13) abstract	1-35
A	WO 99 31713 A (JENOPTIK JENA GMBH) 24 June 1999 (1999-06-24) abstract	1-35
A	US 5 866 024 A (DE VILLENEUVE THIERRY) 2 February 1999 (1999-02-02) abstract	1-35
A	WO 90 05960 A (CRYPTAG LIMITED ; DEMIC SCIENT LIMITED (GB)) 31 May 1990 (1990-05-31) abstract	1-35
A	GB 2 141 365 A (GTE VALERON CORP) 19 December 1984 (1984-12-19) abstract	1-35

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 01/26315

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5389769	A	14-02-1995	JP 3216205 B2 JP 5275296 A DE 69325840 D1 DE 69325840 T2 EP 0562622 A1 TW 423709 Y	09-10-2001 22-10-1993 09-09-1999 25-11-1999 29-09-1993 21-02-2001
DE 4327342	A	23-02-1995	DE 4327342 A1	23-02-1995
US 5526293	A	11-06-1996	US 5661669 A	26-08-1997
EP 0337669	A	18-10-1989	DE 68916463 D1 DE 68916463 T2 EP 0337669 A2 JP 2021794 A JP 2994401 B2 US 5150529 A EP 0337670 A2 JP 2015733 A	04-08-1994 17-11-1994 18-10-1989 24-01-1990 27-12-1999 29-09-1992 18-10-1989 19-01-1990
WO 0002236	A	13-01-2000	TW 452829 B WO 0002236 A2 US 6330971 B1	01-09-2001 13-01-2000 18-12-2001
WO 9931713	A	24-06-1999	US 6418352 B1 EP 1040511 A2 WO 9931713 A2 JP 2002509352 T TW 445418 B	09-07-2002 04-10-2000 24-06-1999 26-03-2002 11-07-2001
US 5866024	A	02-02-1999	FR 2743194 A1 EP 0782001 A1 JP 9190519 A	04-07-1997 02-07-1997 22-07-1997
WO 9005960	A	31-05-1990	WO 9005960 A1	31-05-1990
GB 2141365	A	19-12-1984	AU 555481 B2 AU 2759584 A BE 899915 A1 CA 1237178 A1 CH 669842 A5 DE 3422181 A1 FR 2548349 A1 IT 1209553 B JP 60013202 A KR 9002677 B1 MX 158057 A NL 8401874 A ,B, SE 457336 B SE 8403156 A US 4779319 A US 4978857 A US 5065035 A ZA 8403832 A	25-09-1986 20-12-1984 01-10-1984 24-05-1988 14-04-1989 20-12-1984 04-01-1985 30-08-1989 23-01-1985 23-04-1990 29-12-1988 02-01-1985 19-12-1988 15-12-1984 25-10-1988 18-12-1990 12-11-1991 29-01-1986